

### **REMARKS**

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1 and 3-16 remain in the application and claims 1, 8, 11 and 16 are independent. Claims 11-15 were withdrawn from consideration by the Examiner.

The Office Action dated January 30, 2009 has been received and carefully reviewed. Each issue raised in the Office Action is addressed below. Reconsideration and allowance of the present application are respectfully requested in view of the following remarks.

#### **Claim Rejections – 35 U.S.C. § 103**

Claims 1, 3, 4, 7, 8 and 16 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over JP 2001-123271 to Hoshino et al. (“Hoshino”) in view of U.S. Pub. No. 2001/0029891 to Oh et al. (“Oh”) and U.S. Pat. No. 6,449,521 to Gupta. Applicants submit the Examiner has failed to establish a *prima facie* case of obviousness and respectfully traverse the rejection. A complete discussion of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

In order to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a), the cited references must teach or suggest each and every element in the claims. See M.P.E.P. § 706.02(j); M.P.E.P. 2141-2144.

A brief review of an important feature of the invention may be helpful. One feature of the invention provides a gas introducing nozzle portion wherein the gas introducing nozzle portion is provided within a plasma generating device. Therefore, the plasma generating portion includes both a plasma introducing nozzle portion and a gas introducing nozzle portion, and the two parts of the plasma generating portion are mounted in the space where the substrate is subjected to the desired processing. As should be clear from the disclosure, this particular plasma generating portion facilitates ALD, facilitates the film formation process and facilitates post cleaning processing. Applicants respectfully submit that this combination of elements as set forth in independent claims 1, 8 and 16 is not disclosed or made obvious by the prior art of record, including Hoshino, Oh and Gupta.

Hoshino has been cited to show a reaction container including a plasma generating device 7, 19, including a plasma introducing nozzle portion 4 and a gas introducing nozzle portion 4, the

plasma introducing nozzle portion and the gas introducing nozzle portion mounted in the space where said substrate is subjected to desired processing. The rejection admits that Hoshino does not show a post-processing gas supply unit, exclusive supply nozzles and a controller that controls said post-processing gas supply unit. Oh is cited for a gas flow controller installed at the gas supply pipes to that the activated H<sub>2</sub>O vapor and the trimethyl aluminum gas are repeatedly supplied alternately as described in paragraph [0080]. Gupta is relied upon to show a controller 34, 36, 38.

Applicants respectfully submit to the contrary, Hoshino does not show a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in the space where said substrate is subjected to desired processing. A careful review of Hoshino shows gas nozzles 4 and 9 for introducing NF<sub>3</sub>, SiH<sub>4</sub> and Ar. Each of the Figures of Hoshino also show microwave installation apertures 5, each introducing an electron cyclotron resonance field (ECR as shown in the Figures) separate and spaced apart from the gas nozzles 4 and 9. Each plasma generating device 5 (along with its associated microwave oscillator 19 and power source 21) of Hoshino is entirely separate from the gas introducing nozzles 4 and 9. Therefore, the plasma generating devices 5 of Hoshino do not include a plasma introducing nozzle portion and a gas introducing nozzle portion as claimed, contrary to the allegation in the rejection. This is a specific structural distinction not shown or suggested by Hoshino.

Oh is relied upon in the rejection for a showing of a gas flow controller and alternate application of gas. A careful review of Oh shows first and second plasma generators 350a and 350b, but both are clearly external to the substrate processing space. In addition, Oh has first and second gas induction tubes 345a and 345b, but does not show a plasma generating device including a plasma introducing nozzle portion and a gas introducing nozzle portion mounted in the space where the substrate is subjected to desired processing. Oh does not even disclose nozzle portions of either kind. Therefore, Oh cannot remedy the defects of Hoshino discussed above.

Gupta discloses a generalized controller 34 and gas lines 18 that feed gas to a mixer 19 and feeds the gases to a manifold 11 adjacent a substrate support plate or susceptor 12 for

holding a substrate. Plasma is generated by the application of RF energy between the manifold and susceptor, with the manifold and susceptor merely acting as electrodes (column 4, lines 17-25). There is no nozzle portion for a plasma nor is there a nozzle portion for gas introduction. Finally, there is no plasma generating device including a plasma introducing nozzle portion and gas introducing nozzle portion mounted in the substrate processing space, and therefore Gupta cannot remedy the defects of Hoshino discussed above. Applicants respectfully submit that the combination of elements as set forth in independent claims 1 and 8 is not disclosed or made obvious by the prior art of record, including Hoshino, Oh and Gupta, for the reasons explained above. Likewise, claim 16 has been amended to recite that the reaction container space includes a plasma introducing nozzle portion and some of the supply nozzles of the post-processing gas supply unit are located within the plasma introducing nozzle portion, which features are neither shown nor suggested by Hoshino, Oh and Gupta, as discussed above, and therefore does not establish *prima facie* obviousness of these claims. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Hoshino in view Oh and Gupta, and further in view of JP 11-224858 to Saigo Shingo. This rejection is respectfully traversed. Saigo Shingo is cited to show supplying silane and NF<sub>3</sub> through the same nozzle in a CVD apparatus, referring to Figure 1. Saigo Shingo fails to show or suggest the use of a plasma generating device which includes both a plasma introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in the space where said substrate is subjected to desired processing, and therefore Saigo Shingo cannot remedy the defects of Hoshino, Oh and Gupta discussed above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Claims 6, 9 and 10 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Hoshino in view Oh, Gupta, and further in view of U.S. Pub. No. 2002/0073923 to Saito et al. ("Saito"). This rejection is respectfully traversed. Saito is cited for showing a first gas being a gas including silicon DCS, and for showing a heater 16 surrounding the circumference of the reaction tube 11. To the contrary, Saito fails to show or suggest the use of a plasma generator at all, much less a plasma generating device or plasma producing unit including a plasma

introducing nozzle portion and a gas introducing nozzle portion, the plasma introducing nozzle portion and the gas introducing nozzle portion mounted in a space where said substrate is subjected to desired processing, and therefore Saito cannot remedy the defects of Hoshino, Gupta and Oh discussed above. Accordingly, reconsideration and withdrawal of this rejection are respectfully requested.

Conclusion

All objections and rejections raised in the Office Action having been properly traversed and addressed, it is respectfully submitted that the present application is in condition for allowance. Applicants therefore respectfully request that the Examiner reconsider all presently outstanding rejections and that they be withdrawn. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Notice of same is earnestly solicited.

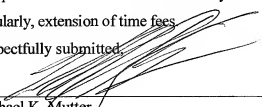
Prompt and favorable consideration of this Amendment is respectfully requested.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone Paul T. Sewell, Registration No. 61,784, at (703) 205-8000, in the Washington, D.C. area.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.14; particularly, extension of time fees

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Respectfully submitted,

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